

CLAIMS

1. A support structure comprising:
an input shaft and an output shaft for input and output of
5 driving force;
a power transmission device coupling the input shaft with
the output shaft;
a housing member housing the input shaft, the output shaft
and the power transmission device;
10 a pair of first bearings aligned in an axial direction, the
first bearings rotatably supporting the input shaft with respect
to the housing member; and
a pair of second bearings aligned in an axial direction,
the second bearings rotatably supporting the output shaft with
15 respect to the housing member,
wherein the power transmission device is disposed between
the pair of the first bearings, and
at least any one pair of the first bearings and the second
bearings are disposed in the vicinity of an input/output device
20 for input/output the driving force to the input shaft and the output
shaft.
2. The support structure of claim 1, wherein:
the input/output device is a change-direction transmission
device.
- 25 3. The support structure of claim 1, wherein:
the power transmission device is disposed so as to
respectively abut shaft side members of the pair of the second
bearings.
4. The support structure of claim 1, wherein:
30 the housing member comprises a wall portion, and
the first bearings are rotatably supported by the wall
portion.
5. The support structure of claim 4, wherein:
the wall portion further comprises an opening, and
35 the input shaft penetrates the opening so as to be coupled

with the output shaft.

6. A gear mechanism:

a change-direction gear set to change a rotation direction of a driving force at a right angle, the change-direction gear
5 set comprising a first change-direction gear and a second change-direction gear;

an input shaft rotating coaxially and integrally with the second change-direction gear;

an output shaft disposed in parallel with the input shaft;

10 a power transmission device coupling the input shaft with the output shaft;

a housing member housing the input shaft, the output shaft and the power transmission device;

a pair of first bearings aligned in an axial direction, the
15 first bearings rotatably supporting the input shaft with respect to the housing member;

a pair of second bearings aligned in an axial direction, the second bearings rotatably supporting the output shaft with respect to the housing member; and

20 a pair of third bearings rotatably supporting the first change-direction gear with respect to the housing member,

wherein the power transmission device is disposed between the pair of the first bearings, and

at least any one pair of the first bearings and the second
25 bearings are disposed in the vicinity of the second change-direction gear.

7. The gear mechanism of claim 6, wherein:

the housing member comprises a first housing member, a second housing member and a third housing member,

30 one of the pair of the first bearings, one of the pair of the second bearings and one of the pair of the third bearings are housed in the first housing member,

another of the pair of the first bearings and another of the pair of the second bearings are housed in the second housing
35 member, and

another of the pair of the third bearings is housed in the third housing member.

8. A gear mechanism comprising:

a change-direction gear set to change a rotation direction
5 of a driving force at a right angle, the change-direction gear set comprising a first change-direction gear and a second change-direction gear;

a first gear rotating coaxially and integrally with the second change-direction gear;

10 a second gear disposed in parallel with and engaged with the first gear;

a third gear disposed in parallel with and engaged with the second gear; and

a casing housing the change-direction gear set, the first
15 gear, the second gear and the third gear.

9. The gear mechanism of claim 8,

wherein the first change-direction gear coupled with an output of a transmission of a vehicle to transmit the output to the third gear, and

20 further comprising a seal to prevent intrusion of oil in the transmission.

10. The gear mechanism of claim 8, further comprising:

a pair of bearings,

wherein at least any one of the first gear, the second gear
25 and the third gear is disposed between the pair of the bearings.

11. The gear mechanism of claim 10, wherein:

at least any one of the first gear, the second gear and the third gear is smaller in diameter than the bearings.

12. The gear mechanism of claim 8, wherein:

30 a plane formed by a rotation axis of the first gear and a rotation axis of the second gear and another plane formed by the rotation axis of the second gear and a rotation axis of the third gear form an angle smaller than 180 degrees and the rotation axis of the third gear is disposed in a direction away from the rotation
35 axis of the first change-direction gear.

13. The gear mechanism of claim 8, wherein:

the second gear and the third gear are disposed offset in respective perpendicular directions relative to the a rotation axis of a power transmission member coupled with the first
5 change-direction gear,

a rotation axis of the first gear is disposed offset in a direction away from the first change-direction gear,

a rotation axis of the second gear is disposed offset in a direction closer to the first change-direction gear than the
10 rotation axis of the first gear, and

a rotation axis of the third gear is disposed offset in a direction more distant from the first change-direction gear than the second gear.

14. The gear mechanism of claim 8, wherein:

15 at least any one of the first change-direction gear and the second change-direction gear is rotatably supported by a pair of bearings receiving force in an axial direction.

15. The gear mechanism of claim 8, wherein:

the first gear is disposed between a pair of bearings
20 rotatably supporting the second change-direction gear and rotatably supported.

16. The gear mechanism of claim 8, wherein:

at least any one of the first change-direction gear and the second change-direction gear comprises a regulation device for
25 regulating tooth contact and pressure of the change-direction gear set by changing an axial direction.

17. The gear mechanism of claim 8, wherein:

a pair of bearings supporting the second gear are roller bearings having cylindrical or needle-like rolling bodies.

30 18. The gear mechanism of claim 17, further comprising:

a positioning device configured to position the roller bearings in an axial direction.

19. The gear mechanism of claim 8, wherein:

any of the first gear, the second gear and the third gear
35 are helical gears.